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Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	141	(Conteras\$.in.)OR(Callewaert\$.in.)OR(Vervecken\$.in.)OR(Kaigorodov\$.in.)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2006/07/20 15:03
L2	11	L1 AND glycosylation	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2006/07/20 15:04
L3	8	L1 AND mannose	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2006/07/20 15:04

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NEWS 11 JUN 26 TULSA/TULSA2 reloaded and enhanced with new search and
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NEWS 14 JUL 14 FSTA enhanced with Japanese patents
NEWS 15 JUL 19 Coverage of Research Disclosure reinstated in DWPI

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MACINTOSH VERSION IS V6.0c(ENG) AND V6.0Jc(JP),
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FILE LAST UPDATED: 19 Jul 2006 (20060719/ED)

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<http://www.cas.org/infopolicy.html>

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=> s glycoprotein
      97485 GLYCOPROTEIN
      106943 GLYCOPROTEINS
L1      150064 GLYCOPROTEIN
          (GLYCOPROTEIN OR GLYCOPROTEINS)
```

```
=> s L1 AND yeast AND human
      195608 YEAST
      33377 YEASTS
      203764 YEAST
          (YEAST OR YEASTS)
      1623485 HUMAN
      337848 HUMANS
      1789583 HUMAN
          (HUMAN OR HUMANS)
L2      881 L1 AND YEAST AND HUMAN
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```
=> s GnT1
L3      14 GNT1
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```
=> s acetylglucosaminyltransferase
      1624 ACETYLGLUCOSAMINYLTRANSFERASE
      179 ACETYLGLUCOSAMINYLTRANSFERASES
L4      1667 ACETYLGLUCOSAMINYLTRANSFERASE
          (ACETYLGLUCOSAMINYLTRANSFERASE OR ACETYLGLUCOSAMINYLTRANSFERAS
          ES)
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=> s L2 AND L4
L5      27 L2 AND L4
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=> d 1-27 ti, so L5
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L5 ANSWER 1 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
TI Transgenic fungi expressing mannosidase, GnTI, GnTII, and/or Galt genes
for preparation of proteins with mammalian N-glycan structure
SO PCT Int. Appl., 84 pp.
CODEN: PIXXD2
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L5 ANSWER 2 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
TI Genetically engineered yeast for production of human
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-like glycoproteins with terminal galactose residues
SO PCT Int. Appl., 120 pp.
CODEN: PIXXD2

L5 ANSWER 3 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
TI Alg14 Recruits Alg13 to the Cytoplasmic Face of the Endoplasmic Reticulum
to Form a Novel Bipartite UDP-N-acetylglucosamine Transferase Required for
the Second Step of N-Linked Glycosylation
SO Journal of Biological Chemistry (2005), 280(43), 36254-36262
CODEN: JBCHA3; ISSN: 0021-9258

L5 ANSWER 4 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
TI N-acetylglucosaminyltransferase III expression in genetically modified lower
eukaryotes
SO U.S. Pat. Appl. Publ., 163 pp., Cont.-in-part of U.S. Ser. No. 371,877.
CODEN: USXXCO

L5 ANSWER 5 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
TI The curcuminoids- and anthocyanins-responsive genes in human
adipocytes and their use in screenings of anti-obesity and anti-diabetes
drugs
SO Jpn. Kokai Tokkyo Koho, 85 pp.
CODEN: JKXXAF

L5 ANSWER 6 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
TI N-acetylglucosaminyltransferase III and other
N-glycan-processing enzymes expressed in lower eukaryotes for the
biosynthesis of human-like oligosaccharide structures in
glycoproteins
SO PCT Int. Appl., 193 pp.
CODEN: PIXXD2

L5 ANSWER 7 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
TI Engineering of an artificial glycosylation pathway blocked in core
oligosaccharide assembly in the yeast *Pichia pastoris*:
Production of complex humanized glycoproteins with terminal
galactose
SO Glycobiology (2004), 14(9), 757-766
CODEN: GLYCE3; ISSN: 0959-6658

L5 ANSWER 8 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
TI Methods for glycan remodeling and glycoPEGylation of therapeutic proteins
SO U.S. Pat. Appl. Publ., 690 pp., Cont.-in-part of U.S. Ser. No. 360,779.
CODEN: USXXCO

L5 ANSWER 9 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
TI Human tissue-specific housekeeping genes identified by
expression profiling
SO PCT Int. Appl., 372 pp.
CODEN: PIXXD2

L5 ANSWER 10 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
TI Erythropoietin glycosylation and the modification of protein structure and
activity for therapeutic use
SO PCT Int. Appl., 1018 pp.
CODEN: PIXXD2

L5 ANSWER 11 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
TI Glycan remodeling and glycoconjugation of granulocyte colony stimulating
factor
SO U.S. Pat. Appl. Publ., 754 pp., Cont.-in-part of U.S. Ser. No. 360,779.
CODEN: USXXCO

L5 ANSWER 12 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Remodeling of protein-linked oligosaccharide moieties and the resulting glycoproteins and glycopeptides
 SO U.S. Pat. Appl. Publ., 749 pp., Cont.-in-part of U.S. Ser. No. 360,779.
 CODEN: USXXCO

L5 ANSWER 13 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Fusion proteins and methods of producing same
 SO PCT Int. Appl., 84 pp.
 CODEN: PIXXD2

L5 ANSWER 14 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Combinatorial DNA library of mammalian glycosylation enzyme genes used for producing modified n-glycans in lower eukaryotes
 SO U.S. Pat. Appl. Publ., 97 pp., Cont.-in-part of U.S. Ser. No. 892,591.
 CODEN: USXXCO

L5 ANSWER 15 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Production of glycoproteins with modified glycosylation in *Pichia pastoris*
 SO PCT Int. Appl., 172 pp.
 CODEN: PIXXD2

L5 ANSWER 16 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Finding of O-mannosyl glycan in mammals and congenital muscular dystrophies due to glycosylation defects
 SO Yakugaku Zasshi (2003), 123(10), 825-835
 CODEN: YKKZAJ; ISSN: 0031-6903

L5 ANSWER 17 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Methods for production of recombinant glycoproteins with mammalian-type carbohydrate structures and their use for production of immunoglobulins
 SO PCT Int. Appl., 125 pp.
 CODEN: PIXXD2

L5 ANSWER 18 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Use of combinatorial genetic libraries to humanize N-linked glycosylation in the yeast *Pichia pastoris*
 SO Proceedings of the National Academy of Sciences of the United States of America (2003), 100(9), 5022-5027
 CODEN: PNASA6; ISSN: 0027-8424

L5 ANSWER 19 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Methods for serial analysis of gene expression of renal dipeptidase in colorectal tumors and their use in diagnosis
 SO PCT Int. Appl., 59 pp.
 CODEN: PIXXD2

L5 ANSWER 20 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Modification of the N-glycosylation pathway of lower eukaryotes to a mammalian type
 SO Abstracts of Papers, 225th ACS National Meeting, New Orleans, LA, United States, March 23-27, 2003 (2003), BIOT-030 Publisher: American Chemical Society, Washington, D. C.
 CODEN: 69DSA4

L5 ANSWER 21 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Endocrine disruptor screening using DNA chips of endocrine disruptor-responsive genes
 SO Jpn. Kokai Tokkyo Koho, 386 pp.
 CODEN: JKXXAF

L5 ANSWER 22 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Sequence of human N-acetylglucosaminyltransferase and
 the uses in biosynthesis of mammalian O-mannosyl glycans
 SO PCT Int. Appl., 79 pp.
 CODEN: PIXXD2

L5 ANSWER 23 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Exploring the acceptor substrate recognition of the human
 β -galactoside α 2,6-sialyltransferase
 SO Journal of Biological Chemistry (2001), 276(24), 21608-21617
 CODEN: JBCHA3; ISSN: 0021-9258

L5 ANSWER 24 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI UDP-N-acetylglucosamine:galactose- β 1,3-N-acetylgalactosamine- α -
 R/(GlcNAc to GalNAc) β 1,6-N- acetylglucosaminyltransferase
 C2GnT3 and its cDNA sequence from human thymus
 SO PCT Int. Appl., 97 pp.
 CODEN: PIXXD2

L5 ANSWER 25 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Production of human compatible high mannose-type sugar chains in
 Saccharomyces cerevisiae auxotrophic mutants with sugar chain
 biosynthesis-associated genes
 SO PCT Int. Appl., 83 pp.
 CODEN: PIXXD2

L5 ANSWER 26 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Engineering of intracellular sialylation pathways for sialylated
 glycoprotein production
 SO PCT Int. Appl., 145 pp.
 CODEN: PIXXD2

L5 ANSWER 27 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Expression and characterization of rat UDP-N-acetylglucosamine:
 α -3-D-mannoside β -1,2-N- acetylglucosaminyltransferase
 I in Saccharomyces cerevisiae
 SO Glycobiology (1999), 9(1), 53-58
 CODEN: GLYCE3; ISSN: 0959-6658

=> dup rem L5

PROCESSING COMPLETED FOR L5

L6 27 DUP REM L5 (0 DUPLICATES REMOVED)

=> d ti, so, ibib, abs 1,2,6,7,8,10-15,17,18,20,26 L5

L5 ANSWER 1 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Transgenic fungi expressing mannosidase, GnTI, GnTII, and/or Galt genes
 for preparation of proteins with mammalian N-glycan structure
 SO PCT Int. Appl., 84 pp.
 CODEN: PIXXD2

ACCESSION NUMBER: 2006:240500 CAPLUS
 DOCUMENT NUMBER: 144:287450
 TITLE: Transgenic fungi expressing mannosidase, GnTI, GnTII,
 and/or Galt genes for preparation of proteins with
 mammalian N-glycan structure
 INVENTOR(S): Joergensen, Christel Thea; Hjort, Carsten
 PATENT ASSIGNEE(S): Novozymes A/S, Den.
 SOURCE: PCT Int. Appl., 84 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2006026992	A1	20060316	WO 2005-DK569	20050907
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			

PRIORITY APPLN. INFO.:

DK 2004-1346

A 20040907

AB The present invention relates to methods for altering the structure of N-glycans in fungal cells and to fungal cells having an altered N-glycan structure. The fungi express one or more of the genes encoding α -1,2-mannosidase, 1,3- α -mannosidase (mannosidase II, E.C. 3.2.1.114), α -1,3-mannosylglycoprotein 2- β -N-acetylglucosaminyltransferase (GnT1, E.C. 2.4.1.101), α -1,6-mannosylglycoprotein 2- β -N-acetylglucosaminyltransferase (GnTII, E.C. 2.4.1.143), and 1,4-galactosyltransferase (GalT, E.C. 2.4.1.38). Transgenic fungi expressing one or more of these genes may be used in production of mammalian proteins, e.g., human monoclonal antibodies. Thus, *Aspergillus oryzae* expressing *A. nidulans* mannosidase IC gene produced heterologous protein with Man5GlcNAc2 N-glycan structure.

REFERENCE COUNT:

13

THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 2 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN

TI Genetically engineered yeast for production of human-like glycoproteins with terminal galactose residues

SO PCT Int. Appl., 120 pp.

CODEN: PIXXD2

ACCESSION NUMBER: 2005:1154698 CAPLUS

DOCUMENT NUMBER: 143:433718

TITLE: Genetically engineered yeast for production of human-like glycoproteins with terminal galactose residues

INVENTOR(S): Davidson, Robert; Gerngross, Tillman; Wildt, Stefan; Choi, Byung-Kwon; Nett, Juergen; Bobrowicz, Piotr; Hamilton, Stephen

PATENT ASSIGNEE(S): Glycofi, Inc., USA

SOURCE: PCT Int. Appl., 120 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 20

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005100584	A2	20051027	WO 2005-IB51249	20050415
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL,			

SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA,
ZM, ZW
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM,
AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT,
RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML,
MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: US 2004-562424P P 20040415

AB The invention provides a lower eukaryotic host cell producing human-like glycoproteins characterized as having a terminal β -galactose residue and essentially lacking fucose and sialic acid residues. The invention also provides methods and compns., including genetic vectors, for catalyzing the transfer of a galactose residue from UDP-galactose onto an acceptor substrate in a recombinant lower eukaryotic host cell. In addition to a UDP-Gal: β GlcNAc β -1,4-galactosyltransferase, expression of UDP-galactose transporter(s), a UDP-specific diphosphatase, and UDP-galactose-4-epimerase, galactokinase, or galactose-1-phosphate uridylyltransferase activities allow transfer of galactose residues onto preferred acceptor substrates for use as therapeutic glycoproteins. The invention claims polypeptide sequences for gene galE UDP-galactose C4 epimerase enzyme and conserved motifs. Methods of the invention can be applied to therapeutic glycoproteins such as erythropoietin, cytokines, blood coagulation factors, Igs, growth factors, or plasminogen. The examples provide maps of integrating plasmid vectors encoding human GalTI, *S. pombe* gene galE epimerase, and *D. melanogaster* gene UGT UDP-galactose transporter. The secreted kringle 3 (K3) domain of plasminogen was the reporter protein for glycosylation in transformed *Pichia pastoris* strains. N-linked glycans obtained from K3 were analyzed by MALDI-TOF mass spectrometry. A *P. pastoris* strain with och1 and alg3 gene deletions, active fusion constructs of mouse mannosidase IB and human GnTI, the *Kluyveromyces lactis* UDP-GlcNAc transporter gene, and a human GalTI gene leader fusion construct had approx. 10-20% of GlcNAc2Man3GlcNAc2 N-glycans on K3 converted to GalGlcNAc2Man3GlcNAc2 and 1-2% to Gal2GlcNAc2Man3GlcNAc2. When a strain with the same genotype was also transformed with the *Saccharomyces cerevisiae* epimerase gene GAL10 under control of the PMAI promoter, about 2/3 of the N-glycans released from K3 contained an addnl. hexose residue (HexGlcNAcMan5GlcNAc2) that could be removed by soluble β -1,4-galactosidase.

L5 ANSWER 6 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN

TI N-acetylglucosaminyltransferase III and other
N-glycan-processing enzymes expressed in lower eukaryotes for the
biosynthesis of human-like oligosaccharide structures in
glycoproteins

SO PCT Int. Appl., 193 pp.
CODEN: PIXXD2

ACCESSION NUMBER: 2004:720587 CAPLUS

DOCUMENT NUMBER: 141:237748

TITLE: N-acetylglucosaminyltransferase III and
other N-glycan-processing enzymes expressed in lower
eukaryotes for the biosynthesis of human
-like oligosaccharide structures in
glycoproteins

INVENTOR(S): Bobrowicz, Piotr; Hamilton, Stephen R.; Gerngross,
Tillman U.; Wildt, Stefan; Choi, Byung-Kwon; Nett,
Juergen Hermann; Davidson, Robert C.

PATENT ASSIGNEE(S): USA

SOURCE: PCT Int. Appl., 193 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 20
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004074458	A2	20040902	WO 2004-US5128	20040220
WO 2004074458	A3	20041229		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI			
RW:	BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
US 2004018590	A1	20040129	US 2003-371877	20030220
US 2005208617	A1	20050922	US 2003-680963	20031007
AU 2004213859	A1	20040902	AU 2004-213859	20040220
CA 2516520	AA	20040902	CA 2004-2516520	20040220
EP 1599595	A2	20051130	EP 2004-713412	20040220
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK			
PRIORITY APPLN. INFO.:			US 2003-371877	A 20030220
			US 2003-680963	A 20031007
			US 2000-214358P	P 20000628
			US 2000-215638P	P 20000630
			US 2001-279997P	P 20010330
			US 2001-892591	A2 20010627
			US 2001-344169P	P 20011227
			WO 2002-US41510	A2 20021224
			WO 2004-US5128	A 20040220
AB	The present invention relates to eukaryotic host cells having modified oligosaccharides which may be modified further by heterologous expression of a set of glycosyltransferases, sugar transporters, and mannosidases to become host-strains for the production of mammalian, e.g., human therapeutic glycoproteins. The process provides an engineered host cell such as <i>Pichia pastoris</i> which can be used to express and target any desirable gene(s) involved in glycosylation. Host cells with modified lipid-linked oligosaccharides are created or selected. N-glycans made in the engineered host cells exhibit N-acetylglucosaminyltransferase III (GnTIII) activity, which produce bisected N-glycan structures and may be modified further by heterologous expression of one or more enzymes, e.g., glycosyltransferases, sugar transporters and mannosidases, to yield human-like glycoproteins. For the production of therapeutic proteins, this method may be adapted to engineer cell lines in which any desired glycosylation structure may be obtained.			
L5	ANSWER 7 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN			
TI	Engineering of an artificial glycosylation pathway blocked in core oligosaccharide assembly in the yeast <i>Pichia pastoris</i> : Production of complex humanized glycoproteins with terminal galactose			
SO	Glycobiology (2004), 14(9), 757-766 CODEN: GLYCE3; ISSN: 0959-6658			
ACCESSION NUMBER:	2004:702495 CAPLUS			
DOCUMENT NUMBER:	141:391680			
TITLE:	Engineering of an artificial glycosylation pathway blocked in core oligosaccharide assembly in the yeast <i>Pichia pastoris</i> : Production of complex humanized glycoproteins with terminal galactose			
AUTHOR(S):	Bobrowicz, Piotr; Davidson, Robert C.; Li, Huijuan; Potgieter, Thomas I.; Nett, Juergen H.; Hamilton,			

Stephen R.; Stadheim, Terrance A.; Miele, Robert G.;
Bobrowicz, Beata; Mitchell, Teresa; Rausch, Sebastian;
Renfer, Eduard; Wildt, Stefan
CORPORATE SOURCE: GlycoFi, Inc., Lebanon, NH, 03766, USA
SOURCE: Glycobiology (2004), 14(9), 757-766
CODEN: GLYCE3; ISSN: 0959-6658
PUBLISHER: Oxford University Press
DOCUMENT TYPE: Journal
LANGUAGE: English

AB A significant percentage of eukaryotic proteins contain post-translational modifications, including glycosylation, which are required for biol. function. However, the understanding of the structure-function relationships of N-glycans has lagged significantly due to the microheterogeneity of glycosylation in mammalian produced proteins. Recently we reported on the cellular engineering of yeast to replicate human N-glycosylation for the production of glycoproteins. Here we report the engineering of an artificial glycosylation pathway in Pichia pastoris blocked in dolichol oligosaccharide assembly. The PpALG3 gene encoding Dol-P-Man:-Man5GlcNAc2-PP-Dol mannosyltransferase was deleted in a strain that was previously engineered to produce hybrid GlcNAcMan5GlcNAc2 human N-glycans. Employing this approach, combined with the use of combinatorial genetic libraries, we engineered P. pastoris strains that synthesize complex GlcNAc2Man3GlcNAc2 N-glycans with striking homogeneity. Furthermore, through expression of a Golgi-localized fusion protein comprising UDP-glucose 4-epimerase and β -1,4-galactosyl transferase activities we demonstrate that this structure is a substrate for highly efficient in vivo galactose addition. Taken together, these data demonstrate that the artificial in vivo glyco-engineering of yeast represents a major advance in the production of glycoproteins and will emerge as a practical tool to systematically elucidate the structure-function relationship of N-glycans.

REFERENCE COUNT: 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 8 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
TI Methods for glycan remodeling and glycoPEGylation of therapeutic proteins
SO U.S. Pat. Appl. Publ., 690 pp., Cont.-in-part of U.S. Ser. No. 360 ,779.
CODEN: USXXCO

ACCESSION NUMBER: 2004:589223 CAPLUS
DOCUMENT NUMBER: 141:122414
TITLE: Methods for glycan remodeling and glycoPEGylation of therapeutic proteins
INVENTOR(S): Defrees, Shawn; Zopf, David; Bayer, Robert; Bowe, Caryn; Hakes, David; Chen, Xi
PATENT ASSIGNEE(S): Neose Technologies, Inc., USA
SOURCE: U.S. Pat. Appl. Publ., 690 pp., Cont.-in-part of U.S. Ser. No. 360 ,779.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 15
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 2004142856	A1	20040722	US 2003-410913	20030409
WO 2003031464	A2	20030417	WO 2002-US32263	20021009
WO 2003031464	A3	20060302		
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 US 2004137557 A1 20040715 US 2002-287994 20021105
 AU 2004236174 A1 20041118 AU 2004-236174 20040409
 CA 2522345 AA 20041118 CA 2004-2522345 20040409
 WO 2004099231 A2 20041118 WO 2004-US11494 20040409
 WO 2004099231 A3 20060316
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 NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY,
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 TD, TG
 EP 1615945 A2 20060118 EP 2004-750118 20040409
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
 IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR
 BR 2004009277 A 20060321 BR 2004-9277 20040409
 PRIORITY APPLN. INFO.:
 US 2001-328523P P 20011010
 US 2001-344692P P 20011019
 US 2001-334233P P 20011128
 US 2001-334301P P 20011128
 US 2002-387292P P 20020607
 US 2002-391777P P 20020625
 US 2002-396594P P 20020717
 US 2002-404249P P 20020816
 US 2002-407527P P 20020828
 WO 2002-US32263 A1 20021009
 US 2002-287994 A2 20021105
 US 2003-360770 A2 20030106
 US 2003-438582P P 20030106
 US 2003-360779 A2 20030219
 US 2003-448381P P 20030219
 US 2003-410897 A 20030409
 US 2003-410913 A 20030409
 US 2003-410930 A 20030409
 US 2003-410945 A 20030409
 US 2003-410962 A 20030409
 US 2003-410980 A 20030409
 US 2003-410997 A 20030409
 US 2003-411012 A 20030409
 US 2003-411026 A 20030409
 US 2003-411037 A 20030409
 US 2003-411043 A 20030409
 US 2003-411044 A 20030409
 US 2003-411049 A 20030409
 WO 2004-US11494 A 20040409

AB The invention includes methods and comps. for remodeling a peptide mol., including the addition or deletion of one or more glycosyl groups to a peptide, and/or the addition of a modifying group to a peptide. Thus, polyethylene glycols were conjugated to CMP or UDP nucleosides for use in modifying recombinant therapeutic proteins.

L5 ANSWER 10 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Erythropoietin glycosylation and the modification of protein structure and

activity for therapeutic use

SO PCT Int. Appl., 1018 pp.

CODEN: PIXXD2

ACCESSION NUMBER: 2004:333839 CAPLUS

DOCUMENT NUMBER: 140:352406

TITLE: Erythropoietin glycosylation and the modification of protein structure and activity for therapeutic use

INVENTOR(S): De Frees, Shawn; Zopf, David; Bayer, Robert; Bowe, Caryn; Hakes, David; Chen, Xi

PATENT ASSIGNEE(S): Neose Technologies, Inc., USA

SOURCE: PCT Int. Appl., 1018 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 15

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004033651	A2	20040422	WO 2003-US31974	20031008
WO 2004033651	A3	20060330		
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WO 2003031464	A2	20030417	WO 2002-US32263	20021009
WO 2003031464	A3	20060302		
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RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
US 2004137557	A1	20040715	US 2002-287994	20021105
CA 2501832	AA	20040422	CA 2003-2501832	20031008
AU 2003287035	A1	20040504	AU 2003-287035	20031008
BR 2003015178	A	20050816	BR 2003-15178	20031008
EP 1581622	A2	20051005	EP 2003-777555	20031008
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PRIORITY APPLN. INFO.:			WO 2002-US32263	A 20021009
			US 2002-287994	A 20021105
			US 2003-360770	A 20030106
			US 2003-360779	A 20030219
			US 2003-410945	A 20030409
			US 2001-328523P	P 20011010
			US 2001-344692P	P 20011019
			US 2001-334233P	P 20011128
			US 2001-334301P	P 20011128
			US 2002-387292P	P 20020607
			US 2002-391777P	P 20020625
			US 2002-396594P	P 20020717
			US 2002-404249P	P 20020816

US 2002-407527P P 20020828
WO 2003-US31974 W 20031008

AB The invention includes methods and compns. for remodeling a peptide mol., including the addition or deletion of one or more glycosyl groups to a peptide, and/or the addition of a modifying group to a peptide. Methods of modifying the structure and properties of erythropoietin by introduction of glycosidation are described. The method uses substitution variants of erythropoietin to introduce sites that can be glycosylated enzymically. The primary glycosylation may then be used to add further sugar residues. The glycosidation, which may include the introduction of N-acetylglucose, N-acetylgalactose, and sialic acid and mannosyl and fucosyl oligosaccharides. The carbohydrate moiety may in turn be modified by PEGylation. A biantennary glycosidated derivative of Epogen had 146% of the activity of the unmodified protein. The glycosylated proteins had longer serum half-lives than the unmodified protein and showed longer term effects on blood Hb levels.

L5 ANSWER 11 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN

TI Glycan remodeling and glycoconjugation of granulocyte colony stimulating factor

SO U.S. Pat. Appl. Publ., 754 pp., Cont.-in-part of U.S. Ser. No. 360,779.
CODEN: USXXCO

ACCESSION NUMBER: 2004:331821 CAPLUS

DOCUMENT NUMBER: 140:353209

TITLE: Glycan remodeling and glycoconjugation of granulocyte colony stimulating factor

INVENTOR(S): Defrees, Shawn; Zopf, David; Bayer, Robert; Bowe, Caryn; Hakes, David; Chen, Xi

PATENT ASSIGNEE(S): Neose Technologies, Inc., USA

SOURCE: U.S. Pat. Appl. Publ., 754 pp., Cont.-in-part of U.S. Ser. No. 360,779.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 15

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004077836	A1	20040422	US 2003-410962	20030409
WO 2003031464	A2	20030417	WO 2002-US32263	20021009
WO 2003031464	A3	20060302		
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RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
US 2004137557	A1	20040715	US 2002-287994	20021105
AU 2004236174	A1	20041118	AU 2004-236174	20040409
CA 2522345	AA	20041118	CA 2004-2522345	20040409
WO 2004099231	A2	20041118	WO 2004-US11494	20040409
WO 2004099231	A3	20060316		
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SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN,
TD, TG

EP 1615945 A2 20060118 EP 2004-750118 20040409

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR

BR 2004009277 A 20060321 BR 2004-9277 20040409

PRIORITY APPLN. INFO.:

US 2001-328523P P 20011010
US 2001-344692P P 20011019
US 2001-334233P P 20011128
US 2001-334301P P 20011128
US 2002-387292P P 20020607
US 2002-391777P P 20020625
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WO 2002-US32263 A1 20021009
US 2002-287994 A2 20021105
US 2003-360770 A2 20030106
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US 2003-411012 A 20030409
US 2003-411026 A 20030409
US 2003-411037 A 20030409
US 2003-411043 A 20030409
US 2003-411044 A 20030409
US 2003-411049 A 20030409
WO 2004-US11494 A 20040409

AB The invention includes a multitude of methods of remodeling a peptide to have a specific glycan structure attached to the peptide. The methods comprise cell-free in vitro addition and/or deletion of sugars to or from a peptide mol. in such a manner as to provide a glycopeptide mol. having a specific customized or desired glycosylation pattern, wherein the glycopeptide is produced at an industrial scale and is suitable for therapeutic use in a mammal. The modified sugar that has been added to the peptide is generated via an enzymic reaction, because enzyme-based addition of conjugate mols. to peptides has the advantage of regioselectivity and stereoselectivity. Thus, a granulocyte colony stimulating factor (G-CSF) peptide that is expressed in a mammalian cell system is trimmed back using a sialidase. The residues thus exposed are modified by the addition of a sialic acid-poly(ethylene glycol) moiety, using an appropriate donor therefor and ST3Gall. Mammalian cell expressed G-CSF is contacted with a sialic acid donor that is modified with levulinic acid, adding a reactive ketone to the sialic acid donor. After addition to a glycosyl residue on the glycan on the peptide, the ketone is derivatized with a moiety such as hydrazine- or amino-PEG. Analogous schemes are provided for G-CSF expressed in an insect or bacterial cell.

L5 ANSWER 12 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN

TI Remodeling of protein-linked oligosaccharide moieties and the resulting glycoproteins and glycopeptides

SO U.S. Pat. Appl. Publ., 749 pp., Cont.-in-part of U.S. Ser. No. 360,779.
CODEN: USXXCO

ACCESSION NUMBER: 2004:269906 CAPLUS

DOCUMENT NUMBER: 140:300039

TITLE: Remodeling of protein-linked oligosaccharide moieties and the resulting glycoproteins and glycopeptides

INVENTOR(S): Defree, Shawn; Zopf, David; Bayer, Robert; Hakes, David; Chen, Xi

PATENT ASSIGNEE(S): Neose Technologies Inc., USA

SOURCE: U.S. Pat. Appl. Publ., 749 pp., Cont.-in-part of U.S. Ser. No. 360,779.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 15

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004063911	A1	20040401	US 2003-411026	20030409
WO 2003031464	A2	20030417	WO 2002-US32263	20021009
WO 2003031464	A3	20060302		
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US 2004137557	A1	20040715	US 2002-287994	20021105
AU 2004236174	A1	20041118	AU 2004-236174	20040409
CA 2522345	AA	20041118	CA 2004-2522345	20040409
WO 2004099231	A2	20041118	WO 2004-US11494	20040409
WO 2004099231	A3	20060316		
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EP 1615945	A2	20060118	EP 2004-750118	20040409
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BR 2004009277	A	20060321	BR 2004-9277	20040409
PRIORITY APPLN. INFO.:				
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			US 2001-344692P	P 20011019
			US 2001-334233P	P 20011128
			US 2001-334301P	P 20011128
			US 2002-387292P	P 20020607
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			WO 2002-US32263	A1 20021009
			US 2002-287994	A2 20021105
			US 2003-360770	A2 20030106
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			US 2003-410897	A 20030409

US 2003-410913	A	20030409
US 2003-410930	A	20030409
US 2003-410945	A	20030409
US 2003-410962	A	20030409
US 2003-410980	A	20030409
US 2003-410997	A	20030409
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US 2003-411026	A	20030409
US 2003-411037	A	20030409
US 2003-411043	A	20030409
US 2003-411044	A	20030409
US 2003-411049	A	20030409
WO 2004-US11494	A	20040409

AB The invention includes a multitude of methods of remodeling a peptide to have a specific glycan structure attached to the peptide. The methods comprise cell-free in vitro addition and/or deletion of sugars to or from a peptide mol. in such a manner as to provide a glycopeptide mol. having a specific customized or desired glycosylation pattern, wherein the glycopeptide is produced at an industrial scale. The modified sugar that has been added to the peptide is generated via an enzymic reaction, because enzyme-based addition of conjugate mols. to peptides has the advantage of regioselectivity and stereoselectivity. A key feature of the invention is to take a peptide produced by any cell type and generate a core glycan structure on the peptide, following which the glycan structure is then remodeled in vitro to generate a glycopeptide having a glycosylation pattern suitable for therapeutic use in a mammal.

L5 ANSWER 13 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN

TI Fusion proteins and methods of producing same

SO PCT Int. Appl., 84 pp.

CODEN: PIXXD2

ACCESSION NUMBER: 2004:143251 CAPLUS

DOCUMENT NUMBER: 140:213579

TITLE: Fusion proteins and methods of producing same

INVENTOR(S): Holgersson, Jan; Liu, Jining; Gustafsson, Anki

PATENT ASSIGNEE(S): Absorber Ab, Swed.; Recopharma Ab

SOURCE: PCT Int. Appl., 84 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004015057	A2	20040219	WO 2003-IB3881	20030811
WO 2004015057	C2	20040729		
WO 2004015057	A3	20050120		
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RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
CA 2495743	AA	20040219	CA 2003-2495743	20030811
AU 2003263411	A1	20040225	AU 2003-263411	20030811
US 2004137580	A1	20040715	US 2003-638820	20030811
EP 1534748	A2	20050601	EP 2003-784433	20030811
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IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK
JP 2005535699 T2 20051124 JP 2004-527246 20030811
PRIORITY APPLN. INFO.: US 2002-402211P P 20020809
WO 2003-IB3881 W 20030811

AB The invention provides mucin-Ig fusion proteins (α Gal fusion proteins) containing multiple α Gal epitopes that are useful as an absorber for anti- α Gal antibodies (i.e. for their removal from blood or plasma prior to a xenotransplantation.). Methods of producing the fusion proteins are also provided. The invention is based in part in the discovery that the carbohydrate epitope Gal α 1,3Gal (α Gal) can be specifically expressed at high d. and by different core saccharide chains on mucin-type protein backbones. More particularly, the invention is based upon the surprising discovery that expression of α Gal epitopes of mucin-type protein backbones is dependent upon the cell line expressing the polypeptide. Moreover, the glycan repertoire of the mucin can be modified by co-expression of exogenous α 1,3 galactosyltransferase and a core 2 branching enzyme. This modification results in a higher d. of α Gal epitopes and an increased binding or removal (i.e., absorption) of anti- α Gal antibodies as compared to free saccharides, α Gal determinants linked to solid phase, or cells transfected with α 1,3 galactosyltransferase alone. Transient transfection of a PSGL-1/mIgG2b fusion protein and porcine α 1,3galactosyltransferase (α 1,3GalT) in COS cells results in a dimeric fusion protein heavily substituted with α Gal epitopes. The fusion protein has approx. terminal α Gal epitopes per dimer and a xenoreactive natural antibodies (XNAb) adsorption efficiency 20 times higher (on a carbohydrate molar basis) than pig thyroglobulin immobilized on agarose beads, and 5,000 and 30,000 times higher than Gal α 1,3Gal-conjugated agarose and macroporous glass beads, resp. To investigate the importance of the host cell for α Gal epitope d. on, and anti-pig antibody adsorption efficacy of, PSGL-1/mIgG2b, the protein, together with the porcine α 1,3GalT, was stably expressed in CHO, COS and 293T cells. The level of α Gal substitution on PSGL-1/mIgG2b and its anti-pig antibody adsorption capacity were dependent on the host cell. PSGL-1/mIgG2b made in COS cells exhibited a 5.3-fold increase in the relative O.D. (GSA-reactivity/anti-mouse IgG reactivity) compared to PSGL-1/mIgG2b made in COS without the α 1,3GalT. Similarly, PSGL-1/mIgG2b made in 293T cells exhibited a 3.1-fold increase in the relative O.D. In contrast, PSGL-1/mIgG2b made in CHO cells exhibited only a 1.8-fold increase. The anti-pig antibody adsorption efficacy of PSGL-1/mIgG2b made in different host cells correlated to its degree of α Gal substitution.

L5 ANSWER 14 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
TI Combinatorial DNA library of mammalian glycosylation enzyme genes used for producing modified n-glycans in lower eukaryotes
SO U.S. Pat. Appl. Publ., 97 pp., Cont.-in-part of U.S. Ser. No. 892,591.
CODEN: USXXCO
ACCESSION NUMBER: 2004:80241 CAPLUS
DOCUMENT NUMBER: 140:158561
TITLE: Combinatorial DNA library of mammalian glycosylation enzyme genes used for producing modified n-glycans in lower eukaryotes
INVENTOR(S): Gerngross, Tillman U.; Wildt, Stefan; Choi, Byung-Kwon; Nett, Juergen Hermann; Bobrowicz, Piotr; Hamilton, Stephen R.; Davidson, Robert C.
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 97 pp., Cont.-in-part of U.S. Ser. No. 892,591.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 20

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004018590	A1	20040129	US 2003-371877	20030220
US 2002137134	A1	20020926	US 2001-892591	20010627
US 7029872	B2	20060418		
EP 1522590	A1	20050413	EP 2004-25648	20010627
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
US 2004230042	A1	20041118	US 2003-616082	20030708
US 2005208617	A1	20050922	US 2003-680963	20031007
US 2004171826	A1	20040902	US 2003-695243	20031027
AU 2004213859	A1	20040902	AU 2004-213859	20040220
AU 2004213860	A1	20040902	AU 2004-213860	20040220
AU 2004213861	A1	20040902	AU 2004-213861	20040220
AU 2004213868	A1	20040902	AU 2004-213868	20040220
AU 2004213869	A1	20040902	AU 2004-213869	20040220
CA 2516440	AA	20040902	CA 2004-2516440	20040220
CA 2516520	AA	20040902	CA 2004-2516520	20040220
CA 2516527	AA	20040902	CA 2004-2516527	20040220
CA 2516544	AA	20040902	CA 2004-2516544	20040220
CA 2516550	AA	20040902	CA 2004-2516550	20040220
WO 2004074458	A2	20040902	WO 2004-US5128	20040220
WO 2004074458	A3	20041229		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI				
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
WO 2004074497	A2	20040902	WO 2004-US5131	20040220
WO 2004074497	A3	20041202		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI				
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
WO 2004074498	A2	20040902	WO 2004-US5132	20040220
WO 2004074498	A3	20050623		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI				
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
WO 2004074461	A2	20040902	WO 2004-US5191	20040220
WO 2004074461	A3	20050317		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI				
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				

WO 2004074499	A2	20040902	WO 2004-US5244	20040220
WO 2004074499	A3	20050127		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI			
RW:	BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
EP 1597379	A2	20051123	EP 2004-713369	20040220
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK			
EP 1597380	A2	20051123	EP 2004-713372	20040220
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK			
EP 1597381	A2	20051123	EP 2004-713388	20040220
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK			
EP 1599595	A2	20051130	EP 2004-713412	20040220
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK			
EP 1599596	A2	20051130	EP 2004-713437	20040220
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK			
US 2006040353	A1	20060223	US 2005-108088	20050415
US 2006024304	A1	20060202	US 2005-187196	20050721
US 2006029604	A1	20060209	US 2005-187229	20050721
US 2006034828	A1	20060216	US 2005-187066	20050721
US 2006034830	A1	20060216	US 2005-187113	20050721
US 2006078963	A1	20060413	US 2005-240432	20050930
US 2006148035	A1	20060706	US 2005-271235	20051110

PRIORITY APPLN. INFO.:

US 2000-214358P	P	20000628
US 2000-215638P	P	20000630
US 2001-279997P	P	20010330
US 2001-892591	A2	20010627
EP 2001-954606	A3	20010627
US 2001-344169P	P	20011227
WO 2002-US41510	A2	20021224
US 2003-371877	A2	20030220
US 2003-616082	A	20030708
US 2003-680963	A	20031007
US 2003-695243	A	20031027
WO 2004-US5128	A	20040220
WO 2004-US5131	A	20040220
WO 2004-US5132	W	20040220
WO 2004-US5191	A	20040220
WO 2004-US5244	A	20040220
US 2004-562424P	P	20040415
US 2004-589926P	P	20040721
US 2004-589979P	P	20040721
US 2004-589981P	P	20040721
US 2004-589988P	P	20040721
US 2004-590011P	P	20040721
US 2004-590051P	P	20040721
US 2004-639657P	P	20041223
US 2004-639698P	P	20041223
US 2005-500240	A2	20050323
US 2005-108088	A2	20050415

AB The present invention relates to use of combinatorial DNA library of mammalian glycosylation enzyme genes for producing modified n-glycans in lower eukaryotes. The invention provides nucleic acid mols. and combinatorial libraries which can be used to successfully target and

express mammalian enzymic activities such as those involved in glycosylation to intracellular compartments in a eukaryotic host cell. Heterologous expression of a set of glycosyltransferases, sugar transporters and mannosidases in eukaryotic host cells enables oligosaccharide modification and the development of host-strains for the production of mammalian glycoproteins. The process provides an engineered host cell which can be used to express and target any desirable gene(s) involved in glycosylation. Host cells with modified oligosaccharides are created or selected. N-glycans made in the engineered host cells have a Man 5 GlcNAc 2 core structure which may then be modified further by heterologous expression of one or more enzymes, e.g., glycosyltransferases, sugar transporters and mannosidases, to yield human-like glycoproteins. With the primary goal of production of human therapeutic glycoproteins, this method may be adapted to engineer cell lines in which any desired glycosylation structure may be obtained.

L5 ANSWER 15 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN

TI Production of glycoproteins with modified glycosylation in *Pichia pastoris*

SO PCT Int. Appl., 172 pp.

CODEN: PIXXD2

ACCESSION NUMBER: 2004:20853 CAPLUS

DOCUMENT NUMBER: 140:88711

TITLE: Production of glycoproteins with modified glycosylation in *Pichia pastoris*

INVENTOR(S): Contreras, Roland; Callewaert, Nico L. M.; Geysens, Steven C. J.; Kaigorodov, Vladimir; Wouter, Vervecken
PATENT ASSIGNEE(S): Flanders Interuniversity Institute for Biotechnology, Belg.

SOURCE: PCT Int. Appl., 172 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004003194	A2	20040108	WO 2003-EP6711	20030625
WO 2004003194	A3	20040422		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
US 2004018588	A1	20040129	US 2002-185475	20020626
CA 2490268	AA	20040108	CA 2003-2490268	20030625
AU 2003238051	A1	20040119	AU 2003-238051	20030625
EP 1516048	A2	20050323	EP 2003-735682	20030625
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK			
JP 2006502705	T2	20060126	JP 2004-516676	20030625
NO 2005000410	A	20050323	NO 2005-410	20050125
PRIORITY APPLN. INFO.:			US 2002-185475	A 20020626
			WO 2003-EP6711	W 20030625

AB The present invention provides genetically engineered strains of methylotrophic yeast including *Pichia* and especially *Pichia pastoris*

capable of producing proteins with reduced or modified glycosylation. Methods of producing glycoproteins with reduced and/or modified glycosylation using such genetically engineered strains of Pichia are also provided. Vectors, which comprise coding sequences for α -1,2-mannosidase I, glucosidase II, GlcNAc-transferase I and mannosidase II or comprising OCH1 disrupting sequence, for transforming methylotrophic yeasts are contemplated by the present invention. Kit for providing the contemplated vectors are also included in this invention.

L5 ANSWER 17 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN
 TI Methods for production of recombinant glycoproteins with mammalian-type carbohydrate structures and their use for production of immunoglobulins
 SO PCT Int. Appl., 125 pp.
 CODEN: PIXXD2
 ACCESSION NUMBER: 2003:551280 CAPLUS
 DOCUMENT NUMBER: 139:112733
 TITLE: Methods for production of recombinant glycoproteins with mammalian-type carbohydrate structures and their use for production of immunoglobulins
 INVENTOR(S): Wildt, Stefan; Miele, Robert Gordon; Nett, Juergen Hermann; Davidson, Robert C.
 PATENT ASSIGNEE(S): Glycofi, Inc., USA
 SOURCE: PCT Int. Appl., 125 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 20
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003056914	A1	20030717	WO 2002-US41510	20021224
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CA 2471551	AA	20030717	CA 2002-2471551	20021224
AU 2002358296	A1	20030724	AU 2002-358296	20021224
EP 1467615	A1	20041020	EP 2002-792535	20021224
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				
JP 2005514021	T2	20050519	JP 2003-557288	20021224
US 2005170452	A1	20050804	US 2003-500240	20021224
US 2004230042	A1	20041118	US 2003-616082	20030708
US 2005208617	A1	20050922	US 2003-680963	20031007
US 2006040353	A1	20060223	US 2005-108088	20050415
US 2006024292	A1	20060202	US 2005-187065	20050721
US 2006029604	A1	20060209	US 2005-187229	20050721
US 2006034829	A1	20060216	US 2005-187079	20050721
US 2006034830	A1	20060216	US 2005-187113	20050721
PRIORITY APPLN. INFO.:			US 2001-344169P	P 20011227
			US 2000-214358P	P 20000628
			US 2000-215638P	P 20000630
			US 2001-279997P	P 20010330

US 2001-892591	A2 20010627
WO 2002-US41510	W 20021224
US 2003-371877.	A2 20030220
US 2004-562424P	P 20040415
US 2004-589913P	P 20040721
US 2004-589937P	P 20040721
US 2004-590011P	P 20040721
US 2004-590030P	P 20040721
US 2004-590051P	P 20040721
US 2004-590052P	P 20040721
US 2004-639657P	P 20041223
US 2004-639698P	P 20041223
US 2005-500240	A2 20050323
US 2005-108088	A2 20050415

AB The present invention relates to host cells having modified lipid-linked oligosaccharides which may be modified further by heterologous expression of a set of glycosyltransferases, sugar transporters and mannosidases to become host-strains for the production of mammalian, e.g., human therapeutic glycoproteins. The process provides an engineered host cell which can be used to express and target any desirable gene(s) involved in glycosylation. Host cells with modified lipid-linked oligosaccharides are created or selected. N-glycans made in the engineered host cells have a GlcNAcMan3GlcNAc2 core structure which may then be modified further by heterologous expression of one or more enzymes, e.g., glycosyltransferases, sugar transporters and mannosidases, to yield human-like glycoproteins. For the production of therapeutic proteins, this method may be adapted to engineer cell lines in which any desired glycosylation structure may be obtained. The invention specifically claims use of nucleic acid sequences for gene ALG3 from *Pichia pastoris*. The ALG3 gene encodes the enzyme which transfers a mannose residue to the Man5-GlcNAc2-PP-Dol precursor. The invention also claims use of genetically engineered host cells for recombinant production of Igs. In examples of the invention, a *Pichia pastoris* strain with deletions of genes *alg3* and *och1* was constructed. This strain was transformed with the Kringle 3 domain of human plasminogen as a glycosylation substrate. Mass spectrometric anal. of N-glycans isolated from the kringle 3 glycoproteins showed GlcNAcMan3GlcNAc2 and GlcNAcMan4GlcNAc2 structures which could be further modified in vitro. Addition of N-acetylglucosamine to GlcNAcMan3GlcNAc2 by N-acetylglucosaminyltransferases II and III yields a "bisected" N-glycan, GlcNAc3Man3GlcNAc2, which has been implicated in greater antibody-dependent cellular cytotoxicity. Methods of the invention can be used to engineer a yeast strain capable of producing glycoproteins with bisected N-glycans and expressing Ig mols. with bisected N-glycans attached to asparagine residue 297 in the CH2 portion.

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 18 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN

TI Use of combinatorial genetic libraries to humanize N-linked glycosylation in the yeast *Pichia pastoris*

SO Proceedings of the National Academy of Sciences of the United States of America (2003), 100(9), 5022-5027
CODEN: PNASA6; ISSN: 0027-8424

ACCESSION NUMBER: 2003:368101 CAPLUS

DOCUMENT NUMBER: 139:95996

TITLE: Use of combinatorial genetic libraries to humanize N-linked glycosylation in the yeast *Pichia pastoris*

AUTHOR(S): Choi, Byung-Kwon; Bobrowicz, Piotr; Davidson, Robert C.; Hamilton, Stephen R.; Kung, David H.; Li, Huijuan; Miele, Robert G.; Nett, Juergen H.; Wildt, Stefan; Gerngross, Tillman U.

CORPORATE SOURCE: Thayer School of Engineering, Dartmouth College,
Hanover, NH, 03755, USA
SOURCE: Proceedings of the National Academy of Sciences of the
United States of America (2003), 100(9), 5022-5027
CODEN: PNASA6; ISSN: 0027-8424
PUBLISHER: National Academy of Sciences
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The secretory pathway of *Pichia pastoris* was genetically re-engineered to perform sequential glycosylation reactions that mimic early processing of N-glycans in humans and other higher mammals. After eliminating nonhuman glycosylation by deleting the initiating α -1,6-mannosyltransferase gene from *P. pastoris*, several combinatorial genetic libraries were constructed to localize active α -1,2-mannosidase and human β -1,2-N-acetylglucosaminyltransferase I (GnTI) in the secretory pathway. First, >32 N-terminal leader sequences of fungal type II membrane proteins were cloned to generate a leader library. Two addnl. libraries encoding catalytic domains of α -1,2-mannosidases and GnTI from mammals, insects, amphibians, worms, and fungi were cloned to generate catalytic domain libraries. In-frame fusions of the resp. leader and catalytic domain libraries resulted in several hundred chimeric fusions of fungal targeting domains and catalytic domains. Although the majority of strains transformed with the mannosidase/leader library displayed only modest in vivo [i.e., low levels of mannose (Man)5-(GlcNAc)2] activity, we were able to isolate several yeast strains that produce almost homogenous N-glycans of the (Man)5-(GlcNAc)2 type. Transformation of these strains with a UDP-GlcNAc transporter and screening of a GnTI leader fusion library allowed for the isolation of strains that produce GlcNAc-(Man)5-(GlcNAc)2 in high yield. Recombinant expression of a human reporter protein in these engineered strains led to the formation of a glycoprotein with GlcNAc-(Man)5-(GlcNAc)2 as the primary N-glycan. Here we report a yeast able to synthesize hybrid glycans in high yield and open the door for engineering yeast to perform complex human-like glycosylation.

REFERENCE COUNT: 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 20 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN

TI Modification of the N-glycosylation pathway of lower eukaryotes to a mammalian type

SO Abstracts of Papers, 225th ACS National Meeting, New Orleans, LA, United States, March 23-27, 2003 (2003), BIOT-030 Publisher: American Chemical Society, Washington, D. C.
CODEN: 69DSA4

ACCESSION NUMBER: 2003:179025 CAPLUS

TITLE: Modification of the N-glycosylation pathway of lower eukaryotes to a mammalian type

AUTHOR(S): Contreras, Roland H.; Vervecken, Wouter; Callewaert, Nico; Geysens, Steven; Kaigorodov, Vladimir
CORPORATE SOURCE: Molecular Biology, Ghent University and VIB, B-9000 Gent, Belg.

SOURCE: Abstracts of Papers, 225th ACS National Meeting, New Orleans, LA, United States, March 23-27, 2003 (2003), BIOT-030. American Chemical Society: Washington, D. C.
CODEN: 69DSA4

DOCUMENT TYPE: Conference; Meeting Abstract

LANGUAGE: English

AB Lower eukaryotes only synthesize N-glycans of the high-mannose type, whereas human glycoproteins have a very divers, complex type of N-glycans. Redirection of the fungal pathway, even to a simple hybrid or complex mammalian type requires several genetic

interventions such as gene knock-outs and heterologous expression of mammalian glycosyl transferases. Furthermore, addnl. in vitro enzymic manipulations may be required. In general, it seems that humanising N-glycans from filamentous fungi is an easier task than modifying yeast protein linked carbohydrates because the long α -1,6-arm apparently is absent. The problem is reduced to importing an efficient α -1,2-mannosidase and addition of complex sugar glycosyl transferases. We started a strategy to humanise the N-glycosylation pathway in the filamentous fungus *Aspergillus niger* NW195. In a first step a HDEL tagged α -1,2-mannosidase from *Trichoderma reesei* was introduced. The over expression of this enzyme lead to the conversion of the majority of the N-glycans to Man5GlcNAc2 (ca. 80%). In a second step the over expression of human N⁶⁴⁹⁷⁹;acetylglucosaminyltransferase I lead to the detection of GlcNAcMan5GlcNAc2 structures. The percentage conversion of Man5GlcNAc2 to GlcNAcMan5GlcNAc2 was inversely related to the amount of protein that was synthesized, ranging from ca. 40% to merely all. Yeasts, like *S. cerevisiae* and *P. pastoris*, have an extra, long α -1,6-arm that is mannose and P-mannose rich. Eliminating this structure causes, at least in *S. cerevisiae*, a weak growth and temperature sensitive phenotype. Different procedures have been followed to knock out the OCH1 gene. Expression of α -1,2-mannosidase has also been obtained in combination with OCH1 knock out, resulting in very high yields of Man5GlcNAc2 N-linked structures. Furthermore, phosphodiester linked mannoses are, in general, unwanted in mammalian therapeutic situations. Knock out of phosphomannosyltransferases is required to eliminate these structures from yeast and fungal protein linked sugars. Cloning of the *P. pastoris* homologues of *S. cerevisiae* MNN4 and MNN6 genes is not an easy task. Ultimately, the terminal sialic acid should be added using in vitro procedures.

L5 ANSWER 26 OF 27 CAPLUS COPYRIGHT 2006 ACS on STN

TI Engineering of intracellular sialylation pathways for sialylated glycoprotein production

SO PCT Int. Appl., 145 pp.

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TITLE: Engineering of intracellular sialylation pathways for sialylated glycoprotein production

INVENTOR(S): Betenbaugh, Michael J.; Lawrence, Shawn; Lee, Yuan C.; Jarvis, Don; Coleman, Timothy A.

PATENT ASSIGNEE(S): Human Genome Sciences, Inc., USA; Johns Hopkins University; University of Wyoming

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DOCUMENT TYPE: Patent

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WO 2000052135	A3	20040108		
W:	AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW			
RW:	GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			

CA 2363297	AA	20000908	CA 2000-2363297	20000301
AU 2000035083	A5	20000921	AU 2000-35083	20000301
JP 2003524395	T2	20030819	JP 2000-602747	20000301
EP 1399538	A2	20040324	EP 2000-913684	20000301
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY				
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US 2005287637	A1	20051229	US 2005-123013	20050506
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			US 2000-516793	B3 20000301
			WO 2000-US5313	W 20000301
			US 2000-227579P	P 20000825
			US 2001-930440	A3 20010816

AB Methods for manipulating carbohydrate processing pathways in cells of interest are provided. Methods are directed at manipulating multiple pathways involved with the sialylation reaction by using recombinant DNA technol. and substrate feeding approaches to enable the production of sialylated glycoproteins in cells of interest. These carbohydrate engineering efforts encompass the implementation of new carbohydrate bioassays, the examination of a selection of insect cell lines and the use of bioinformatics to identify gene sequences for critical processing enzymes. The compns. comprise cells of interest producing sialylated glycoproteins. The methods and compns. are useful for heterologous expression of glycoproteins. Thus, the cDNA for a human sialic acid 9-phosphate synthetase which produces phosphorylated KDN and Neu5Ac from ManNAc-6-P and Man-6-P was cloned and sequenced. Sf9 cells infected with a baculovirus encoding this enzymes produced enhanced levels of sialic acids when the culture medium was supplemented with ManNAc.

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FILE 'CAPLUS' ENTERED AT 14:40:16 ON 20 JUL 2006

L1	150064 S GLYCOPROTEIN
L2	881 S L1 AND YEAST AND HUMAN
L3	14 S GNT1
L4	1667 S ACETYLGLUCOSAMINYLTRANSFERASE
L5	27 S L2 AND L4
L6	27 DUP REM L5 (0 DUPLICATES REMOVED)